UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/039,339	10/23/2001	Bert Boehler	P01,0326	1541

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SCHIFF HARDIN, LLP
PATENT DEPARTMENT
6600 SEARS TOWER
CHICAGO, IL 60606-6473

EXAMINER
MCCARTNEY, LINZY T

ART UNIT	PAPER NUMBER
2671	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)	
Office Action Summary	10/039,339	BOEHLER ET AL.	
	Examiner	Art Unit	
	Linzy McCartney	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>06 August 2002</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-9</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-9</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>23 October 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2.   Claims 3 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3.   Claim 3 recites the limitation "...said plurality of trapezoidal transfer functions..." There is insufficient antecedent basis for this limitation in the claim. Claim 4 is dependent upon claim 3 and includes all the limitations of claim 3 thereby rendering claim 4 indefinite.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,701,000 to Hsieh in view of Konig et al., "Mastering Transfer Function Specification by using VolumePro Technology" (Konig).

      a.   Referring to claim 1, Hsieh discloses an arrangement for generating raw data representing contents of a volume (Fig 1; column 2, lines 36-51) and a computer connected to said arrangement for representing a three-dimensional image of said volume

contents, from said raw data (Fig. 1; lines 52-64). Hsieh does not explicitly disclose

calculating gray-scale values, however it is well known in the art to calculate gray-scale

values in a CT system, Official Notice taken. The suggestion/motivation for doing so

would have been to generate data for display. Hsieh does not explicitly disclose an image

system connected to said computer for generating image signals, according to an

algorithm employing a trapezoidal transfer function which assigns at least one optical

property to the respective gray-scale values, from said gray-scale values; a monitor

connected to said image system and supplied with said image signals for displaying said

three dimensional image; a user-operable input unit connected to said image system; and

said image system generating a histogram distribution of said gray-scale values and

displaying user interface graphics on said monitor including a histogram window in

which said histogram distribution is displayed, said image system in said graphics also

displaying a symbolic trapezoidal transfer function with a plurality of input fields

respectively associated with different points of said symbolic trapezoidal transfer

function, said input unit allowing entries into said input fields to select the trapezoidal

transfer function employed in said algorithm, and said image system inserting a

representation of the selected trapezoidal transfer function in said histogram window.

Konig discloses an image system connected to said computer for generating image

signals, according to an algorithm employing a trapezoidal transfer function which

assigns at least one optical property to the respective gray-scale values, from said gray-

scale values (page 6, column 1, paragraph 2; page 2); and said image system generating a

histogram distribution of said gray-scale values and displaying user interface graphics

including a histogram window in which said histogram distribution is displayed (page 3,

column 2, paragraph 3 – page 4, column 1, paragraph 2; Fig. 4), said image system in

said graphics also displaying a symbolic trapezoidal transfer function (Fig. 4; page 3,

column 2, paragraph 3) with a plurality of input fields respectively associated with

different points of said symbolic trapezoidal transfer function, said input unit allowing

entries into said input fields to select the trapezoidal transfer function employed in said

algorithm (page 4, column 2, paragraph 6 – page 5, column 2, paragraph 1), and said

image system inserting a representation of the selected trapezoidal transfer function in

said histogram window (page 3, column 2, paragraph 3; Fig. 4). Konig does not explicitly

disclose a monitor connected to said image system and supplied with said image signals

for displaying said three dimensional image, a user-operable input unit connected to said

image system, however it is old and well known to connect a monitor and user input to an

imaging system, Official Notice taken. The suggestion/motivation for doing so would

have been because it would allow for display of the image data and allow the user to

input data into the system. At the time the invention was made, it would have been

obvious to one of ordinary skill in the art to modify the apparatus of Hsieh by including

an image system as taught by Konig. The suggestion/motivation for doing so would have

been because it would simplify the specification of transfer functions and provide

interactive feedback (Konig, page 6, column 1, paragraph 5 – column 2, paragraph 3).

b.   Referring to claim 2, Hsieh does not explicitly disclose wherein said image

system displays a selection bar in said graphics and wherein said input unit allows one of

a plurality of transfer functions identified by said selection bar to be selected for

representation in said graphics. Konig discloses wherein said image system displays a

selection bar in said graphics and wherein said input unit allows one of a plurality of

transfer functions identified by said selection bar to be selected for representation in said

graphics (Fig. 4, note the series of check boxes).

c.   Referring to claim 3, Hsieh does not explicitly disclose wherein said image

system represents all of said plurality of trapezoidal transfer functions, which are

selectable via said selection bar, in said histogram window, and wherein said image

system marks the trapezoidal transfer function in said histogram window that is selected

via said selection bar. Konig disclose wherein said image system represents all of said

plurality of trapezoidal transfer functions, which are selectable via said selection bar, in

said histogram window, and wherein said image system marks the trapezoidal transfer

function in said histogram window that is selected via said selection bar (Fig. 4, note the

series of check boxes).

b.   Referring to claim 5, Hsieh does not explicitly disclose wherein said symbolic

trapezoidal transfer function has corner points, and wherein said input fields are

respectively associated with said corner points and wherein said input allows, by

respective entries in said input fields, selection of said corner points and thus selection of

their respective gray-scale range. Konig discloses wherein said symbolic trapezoidal

transfer function has corner points, and wherein said input fields are respectively

associated with said corner points and wherein said input allows, by respective entries in

said input fields, selection of said corner points and thus selection of their respective

gray-scale range (Fig. 4; page 4, column 1, paragraph 7 – column 2, paragraph 1).

c.   Referring to claim 6, Hsieh does not explicitly disclose wherein said at least one

optical property is selected from the group consisting of brightness, color, and

transparency, and wherein said image system displays an input field in said graphics

allowing said at least one optical property to be varied via said input unit. Konig discloses

wherein said at least one optical property is selected from the group consisting of

brightness, color, and transparency, and wherein said image system displays an input

field in said graphics allowing said at least one optical property to be varied via said input

unit (Figs. 5 and 7; page 4, column 2, paragraphs 2-6).

d.   Referring to claim 7, Hsieh does not explicitly disclose wherein said histogram

distribution in said histogram window has a gray-scale value range, and wherein said

image system displays a scroll bar in said graphics allowing, via said input unit, variation

of said gray-scale range. Konig discloses wherein said histogram distribution displayed in

said histogram window has gray-scale value range, and wherein said image system

displays in said graphics allowing, via said input unit variation of said gray-scale range

(Fig. 4).

e.   Referring to claim 8, Hsieh does not explicitly disclose wherein said image

system generates said image signals according to a volume rendering algorithm. Konig

discloses wherein said image system generates said image signals according to a volume

rendering algorithm (page 2, column 1, paragraph 5; Fig. 2).

f.   Referring to claim 9, Hsieh does not explicitly disclose wherein said image

system comprises a memory in which a plurality of different trapezoidal transfer

functions are stored and wherein said image system displays an input field in said

graphics allowing selection, via said input unit, of one of the trapezoidal transfer

functions stored in said memory for use as said trapezoidal transfer function employed in

said algorithm. Konig discloses wherein said image system comprises a memory (page 6,

column 1, paragraph 2) in which a plurality of different trapezoidal transfer functions are

stored and wherein said image system displays an input field in said graphics allowing

selection, via said input unit, of one of the trapezoidal transfer functions stored in said

memory for use as said trapezoidal transfer function employed in said algorithm (Fig. 4,

note the series of check boxes).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Linzy McCartney** whose telephone number is **(703) 605-0745**.

The examiner can normally be reached on Mon-Friday (8:00AM-5: 30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,

Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

ltm
05 May 2004

MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600